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# The Future of Space Exploration: SpaceX's Petitions for *Inter Partes* Review Against Blue Origin's Rocket-Landing Technology

Joshua T. Smith\*

## I. INTRODUCTION

Since the end of the National Aeronautics and Space Administration's (NASA) Shuttle program, space exploration has become more prevalent amongst privately owned companies, like Space Exploration Technologies Corporation (SpaceX).<sup>1</sup> The high cost of launching a rocket remains the determining factor in both how and when private space exploration will become a reality.<sup>2</sup> Blue Origin, LLC (Blue Origin), a SpaceX competitor founded by Amazon.com CEO Jeff Bezos,<sup>3</sup> secured Patent No. 8,678,321 B2 ('321 patent), which involves landing and recovering a reusable launch vehicle (RLV) in order to make rocket launching exponentially cheaper.<sup>4</sup> Elon Musk, the CEO of SpaceX, filed two petitions challenging the '321 patent's validity in order to avoid potential infringement.<sup>5</sup> The Patent Trial and Appeal Board (PTAB) denied *inter partes* review of Claims 14 and 15 (Petition One), stating that the "challenged claims are not amenable to construction."<sup>6</sup> Thus, the PTAB was "unable to reach a determination on the reasonable likelihood of SpaceX prevailing on the ground asserted in the Petition."<sup>7</sup> The PTAB, however, determined that the second petition (Petition Two) "demonstrated a reasonable likelihood that it would prevail in showing unpatentability" and granted *inter partes* review.<sup>8</sup>

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1. See Seth Borenstein, *NASA To Privatize Space Travel After Last Shuttle Lands*, NEOGAF (July 20, 2011, 5:50 PM), <http://www.neogaf.com/forum/showthread.php?t=437997>.
2. SpaceX, *About SpaceX*, SPACEX, <http://www.spacex.com/about> (last visited June 21, 2016).
3. Kenneth Chang, *Bezos-Run Rocket Firm Will Launch in Florida*, N.Y. TIMES, Sept. 16, 2015, at B2, available at [http://www.nytimes.com/2015/09/16/science/space/jeff-bezos-rocket-company-to-build-and-launch-in-florida.html?\\_r=0](http://www.nytimes.com/2015/09/16/science/space/jeff-bezos-rocket-company-to-build-and-launch-in-florida.html?_r=0).
4. U.S. Patent No. 8,678,321 (filed June 14, 2010) (issued Mar. 24, 2015).
5. See Space Expl. Tech. Corp. v. Blue Origin LLC, No. IPR2014-01376, Paper No. 2 (P.T.A.B. Mar. 3, 2015) [hereinafter *Petition Two*]; Space Expl. Tech. Corp. v. Blue Origin LLC, No. IPR2014-01378, Paper No. 2 (P.T.A.B. Mar. 3, 2015) [hereinafter *Petition One*].
6. Space Expl. Tech. Corp. v. Blue Origin LLC, No. IPR2014-01378, Paper No. 6, 2 (P.T.A.B. Mar. 3, 2015) [hereinafter *Decision One*].
7. *Id.*
8. Space Expl. Tech. Corp. v. Blue Origin LLC, No. IPR2014-01376, Paper No. 6, 2 (P.T.A.B. Mar. 3, 2015) [hereinafter *Decision Two*].

This proceeding brings up an interesting question: what type of precedent does the PTAB set by denying Petition One due to a lack of sufficient disclosure of structure under 35 U.S.C. § 112(f) rendering the claim indefinite? In answering this question, this note analyzes the potential impact on future *inter partes* reviews based on the different outcomes reached by the PTAB. This note also discusses the strategy taken by SpaceX and its implications on the future of space travel.

## II. BACKGROUND

Elon Musk (Musk) founded SpaceX in 2002 with the ultimate goal of enabling people to live on other planets by developing reusable rockets to radically reduce the cost of manned space travel.<sup>9</sup> SpaceX gained worldwide attention for being the only private company to return a spacecraft from low-Earth orbit (LEO), as well as to attach a vessel to the International Space Station (ISS), exchange cargo, and return safely to Earth.<sup>10</sup> This success convinced NASA to contract with SpaceX to fly up to twelve more missions to the ISS in exchange for \$1.6 billion.<sup>11</sup>

Jeff Bezos founded Blue Origin in 2000 with a similar goal as SpaceX: to make space travel exponentially cheaper in order to increase commercialized space travel.<sup>12</sup> Blue Origin contracted with United Launch Alliance (ULA) in late 2014 to jointly fund development of the new BE-4 rocket engine.<sup>13</sup> BE-4 is the first engine designed by Blue Origin that combusts liquid oxygen and liquid methane propellants.<sup>14</sup> ULA is a joint venture between Lockheed Martin Space Systems and Boeing Defense, Space & Security that provides approximately 1,300 spacecraft launch missions to the U.S. government.<sup>15</sup>

On March 25, 2014, the U.S. Patent and Trademark Office (PTO) issued the '321 patent to Blue Origin.<sup>16</sup> The '321 patent, titled "Sea landing of space launch vehicles and associated systems and methods," relates to a controlled landing on a sea-going platform in a manner that allows for recovery of the

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9. SpaceX, *supra* note 2.

10. *Id.*

11. *Id.*

12. Elizabeth Howell, *Jeff Bezos: Biography of Blue Origin, Amazon Founder*, SPACE.COM (Jan. 18, 2013), <http://www.space.com/19341-jeff-bezos.html>.

13. *United Launch Alliance and Blue Origin Announce Partnership to Develop New American Rocket Engine*, UNITED LAUNCH ALLIANCE, <http://www.ula.launch.com/ula-and-blue-origin-announce-partnership.aspx> (last visited June 21, 2016).

14. *Id.*

15. *Quick Facts*, UNITED LAUNCH ALLIANCE, [http://www.ulalaunch.com/about\\_quickfacts.aspx](http://www.ulalaunch.com/about_quickfacts.aspx) (last visited June 21, 2016).

16. See U.S. Patent No. 8, 678, 321.

rocket to be used again at minimal cost.<sup>17</sup> Generally, a RLV launches from the Earth's surface, comprising of a booster rocket propelling cargo to a high-altitude flight profile.<sup>18</sup> Upon reaching a predetermined altitude, the booster rocket separates from the payload and descends back towards the Earth's surface, while the payload continues its trajectory into orbit.<sup>19</sup> As described in the '321 patent, during reentry, the booster rocket reignites its engines to slow its decent and repositions itself into a "tail-first" position as it nears the sea-going platform.<sup>20</sup> Once the sea-going platform is close enough, the rocket booster performs a low speed "vertical, powered landing" onto the deck.<sup>21</sup>

SpaceX filed Petition One for *inter partes* review on Claims 14 and 15 of the '321 patent, challenging the patentability of the claims on the single ground of obviousness under 35 U.S.C. § 103.<sup>22</sup> Claim 14 is independent, while Claim 15 is dependent, merely adding detail about the vehicle landing and nothing of patentable significance.<sup>23</sup> SpaceX initially asserted that Claims 14 and 15 contained means-plus-function claim limitations, invoking analysis under Section 112(f).<sup>24</sup> The PTAB concluded that the challenged claims were not amenable to construction, and the PTAB was "unable to reach a determination on the reasonable likelihood that SpaceX would prevail on the ground asserted in the Petition."<sup>25</sup> In other words, the '321 patent lacked a meaningful disclosure of structure for the claimed "means," leaving a "skilled artisan to speculate about what is claimed."<sup>26</sup> SpaceX filed Petition Two for *inter partes* review on Claims 1 through 13 of the '321 patent, challenging the patentability of the claims on the grounds of novelty under 35 U.S.C. § 102 and obviousness under 35 U.S.C. § 103.<sup>27</sup>

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17. *Id.*

18. *Id.*

19. *Id.*

20. *Petition One*, *supra* note 5, at 12.

21. *Id.*

22. *Id.* at 1 (SpaceX filed Petition One on August 25, 2014, within the nine-month time period to file for an *inter partes* review).

23. *Id.* at 14–15.

24. *Id.* (35 U.S.C. § 112(f) was previously § 112, ¶ 6).

25. *Decision One*, *supra* note 6, at 1.

26. *Id.* at 4.

27. *Petition Two*, *supra* note 5, at 3–4, 56 (SpaceX filed Petition Two on August 25, 2014, within the nine-month time period to file for an *inter partes* review).

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### III. BACKGROUND LAW AND PROCEDURE

This section will discuss *inter partes* review by describing its procedure and patentability requirements. Additionally, this section briefly discusses means-plus-function claims.

#### A. *Inter Partes* Review Procedure

An *inter partes* review allows any third-party to “request [the PTAB] to cancel as unpatentable one or more claims of a patent” by using only Section 102 or 103.<sup>28</sup> During an *inter partes* review, the PTAB reviews “the patentability of [one] or more claims in a patent only on the grounds that could be raised under sections 102 or 103, and only on the basis of prior art consisting of patents or printed publications.”<sup>29</sup> The *inter partes* process begins when a third-party files a petition after the later of either: (1) nine months after the grant of the patent; or (2) the date of termination of the post grant review, if a post grant review is instituted.<sup>30</sup> The *inter partes* review may be granted if the petitioner shows a reasonable likelihood of prevailing with respect to at least one of the challenged claims.<sup>31</sup> If it is granted, the PTAB will issue a final determination on the patentability of the claim within one year.<sup>32</sup>

##### i. 35 U.S.C. § 102 Novelty Requirement

Section 102 addresses the requirement of novelty for patentability and requires that the claimed invention is new and not *anticipated* by a “prior art.”<sup>33</sup> An invention “patented, described in a printed publication, or in a public use, on sale or otherwise available to the public before the effective filing date” by a third party is considered prior art.<sup>34</sup> If any prior art anticipates the invention, it fails the novelty requirement, making the invention unpatentable.<sup>35</sup> To prove anticipation, the party challenging the patent’s validity must show that each limitation of the claimed invention is disclosed, either expressly or inherently, in a *single prior art reference* prior to the inventor’s date of invention.<sup>36</sup>

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28. 35 U.S.C. § 311(a)–(b) (2013).

29. § 311(b).

30. § 311(c).

31. § 314(a) (2012).

32. § 316(a)(11) (2012).

33. *See* § 102(a) (2015).

34. *Id.*

35. *See* *Atlas Powder Co. v. IRECO, Inc.*, 190 F.3d 1342, 1346 (Fed. Cir. 1999).

36. *See id.*

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## ii. 35 U.S.C. § 103 Nonobviousness Requirement

Under Section 103, an invention fails the nonobviousness requirement for patentability if it “would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art.”<sup>37</sup> This requirement prevents the issuance of a patent that would operate to withdraw what is already known to the public and removes those inventions that would not be disclosed or devised but for the inducement of a patent.<sup>38</sup>

The obviousness test set forth in *Graham v. John Deere Co.* analyzes “whether the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains.”<sup>39</sup> The *Graham* test guides a court by analyzing the following four factors: (1) the scope and content of the prior art to be determined; (2) the differences between the prior art and the claims at issue; (3) the level of ordinary skill in the pertinent art; and (4) secondary considerations, such as commercial success, and long-felt but unsolved need for the technology.<sup>40</sup> After reviewing these factors, the decision-maker can combine the relevant prior art to determine obviousness.

## B. Means-Plus-Function Claims

Section 112(f) permits patentees to draft a claim using functional language, while also disclosing structural aspects—the “means”—in the specification.<sup>41</sup> A *functional* claim term recites a feature by what it does rather than by what it is.<sup>42</sup> A claim invokes Section 112(f) when its language incorporates phrases such as “means for” or “step for” followed by the functional language.<sup>43</sup> Courts interpret the use of this language to indicate that a patentee has not identified the structure that performs the function and that the patentee is relying on disclosures elsewhere in the patent.<sup>44</sup>

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37. 35 U.S.C. § 103 (2011).

38. See *Graham v. John Deere Co.*, 383 U.S. 1, 14–15 (1966).

39. *Id.* at 3.

40. *Id.* at 17.

41. See 35 U.S.C. § 112(f) (2012).

42. Gener Quinn, *A Primer on Indefiniteness and Means-Plus-Function*, IPWATCHDOG (Apr. 18, 2012), <http://www.ipwatchdog.com/2012/04/18/a-primer-on-indefiniteness-and-means-plus-function/id=23854/>.

43. See *Warner-Jenkinson Co., Inc. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 27–28 (1997).

44. *Id.* at 37.

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#### IV. PATENT AND TRIAL APPEALS BOARD DECISION AND RATIONALE

##### A. Petition One

The PTAB began by analyzing claim construction, giving the claim “its broadest reasonable construction in light of the specification of the patent in which it appears.”<sup>45</sup> The PTAB, in *Space Exploration Technologies*, recognized that Claim 14<sup>46</sup> and the limitation of dependent Claim 15 were written in a “means-plus-function” format.<sup>47</sup> A dependent claim must be narrower in scope than the independent claim it is based on.<sup>48</sup> The PTAB stated SpaceX erred in several claim limitations: the construction of the “means for igniting” the rocket engines; the “means for shutting off” the rocket engines; and in the “means for reigniting” the rocket engines. SpaceX’s arguments failed because they sought to broaden the scope of the limitations beyond what is permissible under Section 112(f).<sup>49</sup> The PTAB found Space X failed to follow the two-step process in construing these limitations, even though the “means for” igniting, shutting off, and reigniting the engines were modified by functional language that did not include any structure for performing such functions.<sup>50</sup> The court’s analysis, however, primarily focused on the second step.

The second step describes a “corresponding” structure which was disclosed in a specification when “the specification or prosecution history

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45. 37 C.F.R. 42.100(b) (2014).

46. *Petition One*, *supra* note 5, at 3–4 (“A system for providing access to space, the system comprising: (1) a space launch vehicle, wherein the space launch vehicle includes one or more rocket engines; (2) a launch site; (3) a sea going platform; (4) means for launching the launch vehicle from the launch site a first time, wherein the means for launching include *means for igniting the one or more rocket engines* and launching the vehicle in a nose-first orientation; (5) *means for shutting off the one or more rocket engines*; (6) means for reorienting the launch vehicle from the nose-first orientation to a tail-first orientation before landing; (7) *means for reigniting at least one of the one or more rocket engines* when the launch vehicle is in the tail-first orientation to decelerate the vehicle; (8) means for landing at least a portion of the launch vehicle on the sea going platform in a body of water wherein (a) the means for landing include means for landing in the tail-first orientation while the one or more rocket engines are thrusting; and (b) means for launching at least a portion of the launch from the launch site a second time” (emphasis added)).

47. *Decision One*, *supra* note 6, at 4.

48. *See* *Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1562 (Fed. Cir. 1991).

49. *Decision One*, *supra* note 6, at 5.

50. *Id.* at 5–6 (quoting *Golight, Inc. v. Wal-Mart Stores, Inc.*, 355 F.3d 1327, 1333–34 (Fed. Cir. 2004) (the two step process includes “(1) ‘defin[ing] the particular function of the claim limitation’; and (2) ‘look[ing] to the specification and identify the corresponding structure for that function.’”).

clearly links or associates that structure to the function recited in the claim.”<sup>51</sup> SpaceX argued that the specification is “silent on details about igniting, shutting off, or reigniting the engines, in terms of both structure and function.”<sup>52</sup> SpaceX also urged the PTAB to interpret the “means for” limitations as “any suitable structure” that ignites, shuts off, or reignites a rocket engine.<sup>53</sup> Nevertheless, the PTAB refused to construe SpaceX’s means-plus-function limitations for Claim 14 to cover “any suitable structure” capable of performing the recited function.<sup>54</sup> The PTAB reasoned that interpreting the language to encompass *any* structure for performing the recited function violates both Section 112(f) and the standard of applying the “broadest *reasonable* construction” to claims in an *inter partes* review.<sup>55</sup>

The specifications in Claims 14 and 15 do not mention “whether the functional aspects of the means to ignite, shut off, and reignite the engines are internal or external” and thus fail to be “precise enough to notify a skilled artisan of what is claimed and disclosed to the public.”<sup>56</sup> The PTAB held that an insufficient disclosure of structure under § 112(f) renders a claim indefinite and, thus, not amenable to construction.<sup>57</sup> Because the PTAB could not ascertain the breadth of Claim 14, it could not “undertake the necessary factual inquiry for evaluating obviousness with respect to difference between the claimed subject matter and the prior art.”<sup>58</sup> Thus, any analysis of the prior art asserted in Petition One “would be speculative and futile” in determining whether there is a reasonable likelihood that SpaceX would prevail under § 103.<sup>59</sup>

## B. Petition Two

The PTAB recognized a clear similarity between Claims 1–3 and the paper by Yoshiyuki Ishijima, titled *Re-entry and Terminal Guidance for Vertical-Landing TSTO (Two-Stage to Orbit)*, in SpaceX’s evidence.<sup>60</sup> Claim 1 recites “launching” a space-launch vehicle from a coastal launch site, Claim

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51. *Id.*

52. *Id.* at 6.

53. *Id.*

54. *Id.* at 6–7.

55. *Id.* at 6.

56. *Decision One*, *supra* note 6, at 7–8.

57. *Id.* at 8 (citing *In re Aoyama*, 656 F.3d 1293, 1298 (Fed. Cir. 2011)).

58. *Id.* at 8–9 (quoting *Aoyama*, 656 F.3d at 1296) (“The first step involves construction of the claims of the patent at issue.”).

59. *Id.* at 9.

60. *Decision Two*, *supra* note 8, at 7; see Yoshiyuki Ishijima et al., *Re-entry and Terminal Guidance for Vertical-Landing TSTO (Two-Stage to Orbit)*, GUIDANCE, NAVIGATION, AND CONTROL CONFERENCE AND EXHIBIT, (1998), available at <http://arc.aiaa.org/doi/abs/10.2514/6.1998-4120>.



2 recites “reorienting” the vehicle from a nose-first to a tail-first orientation after launch, and Claim 3 recites “vertically landing” the vehicle on a sea-going platform “while providing thrust” from the vehicle’s engines.<sup>61</sup> SpaceX explained that Ishijima’s paper “disclos[es] an RLV that utilizes a flight and recovery sequence identical to the one described and claimed in the ‘321 patent.”<sup>62</sup> Thus, the PTAB determined SpaceX demonstrated a reasonable likelihood that Ishijima’s paper anticipated claims 1 through 3.<sup>63</sup>

SpaceX next asserted Claims 4 through 6 were obvious because of papers by Ishijima, Mueller, and Kindem.<sup>64</sup> Claims 4 and 5, dependent on Claim 1, include the steps of “refurbishing” and “reusing” the space launch vehicle.<sup>65</sup> Claim 6 also depends on Claim 1; it includes the additional step of “transferring” the recovered vehicle from the floating platform to a “transit vessel.”<sup>66</sup> Ishijima’s paper discusses “the RLV as being ‘transferred to the launch site on a large tanker or pontoons’”; however, the paper does not necessarily disclose the details of transferring and refurbishing of the RLV, despite describing a similar process.<sup>67</sup> Moreover, Mueller’s patent taught a well-known process for refurbishing and transferring, and Kindem taught a technique for transferring from the floating platform.<sup>68</sup> The PTAB was persuaded by SpaceX’s argument that Claims 4 and 5 could be obvious to one having ordinary skill in the art when the recovery and refurbishment techniques of Mueller are combined with the launch recovery method suggested by Ishijima.<sup>69</sup> This is because “both methods have the common objective of reducing operational costs for space transportation by avoiding new booster rockets and reducing waste material.”<sup>70</sup> Further, the PTAB was persuaded by SpaceX’s argument that Claim 6 could be obvious to one having ordinary skill in the art, when combining the Kindem transfer and transport technique with the recovery method suggested by Ishijima.<sup>71</sup> The PTAB was convinced

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61. *Decision Two*, *supra* note 8, at 6–7.

62. *Id.* at 6.

63. *Id.* at 7.

64. *Id.*

65. *Id.*

66. *Id.*

67. *Decision Two*, *supra* note 8, at 7.

68. *Id.* at 8; *see* U.S. Patent No. 6,158,693 (filed July 27, 1999); *see also* U.S. Patent No. 5,927,653 (filed Feb. 15, 2000); U.S. Patent No. 6,024,006 (filed Dec. 12, 2000).

69. *Decision Two*, *supra* note 8, at 8.

70. *Id.*

71. *Id.*

because “the combination would increase the speed transport to land and permit the floating platform to remain in position.”<sup>72</sup>

Additionally, SpaceX persuaded the PTAB that Claim 7 could be obvious to one having ordinary skill in the art by combining Spencer’s specific altitude teaching with the Ishijima two-stage separation teaching.<sup>73</sup> SpaceX established that both Ishijima and Spencer are concerned with enabling the payload stage to proceed to orbit while permitting the booster stage to be recovered and reused.<sup>74</sup> Furthermore, SpaceX convinced the PTAB by incorporating the Waters teaching into Ishijima’s terminal guidance procedures for the RLV by Ishijima.<sup>75</sup> The Waters lecture “teaches a ‘sea-based variant’” of a precision navigation system that transmits reference data to unmanned aircraft for landing on an ocean platform.”<sup>76</sup> Thus, a reasonable likelihood of unpatentability exists due to obviousness because both “Ishijima and Waters require precision landing of an unmanned vehicle on a sea-based platform.”<sup>77</sup>

Finally, SpaceX persuaded the PTAB that Claims 8, 9, 12, and 13 could also be obvious to one having ordinary skill in the art because Ishijima’s reorientation and landing sequence incorporates Lane’s aerodynamic flap technique to control the descent and landing of the vehicle.<sup>78</sup> Indeed, both Ishijima’s and Lane’s RLVs “utilize[ ] aerodynamic forces and engine reignition to control descent and landing of the vehicle.”<sup>79</sup>

Finally, SpaceX persuaded the PTAB that Claims 10 and 11 could be obvious to one having ordinary skill in the art when the “propulsive thrusters of Mueller and the sea-based guidance control of Waters” are incorporated into the “terminal guidance procedures for the booster stage in Ishijima . . .

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72. *Id.*

73. *Id.* at 8–9 (“Claim 7 further defines the space launch vehicle as having a booster stage and a payload stage. In doing so, claim 7 adds the steps of (1) turning off the engines on the booster stage, (2) separating the booster stage from the payload stage ‘at predetermined altitude,’ (3) utilizing ‘positional information’ to control the trajectory of the booster stage toward the landing platform, and (4) reigniting the engines for vertically landing the booster stage on the platform.”); U.S. Patent No. 6,450,452 (filed May 24, 1999) (teaching a “predetermined time, elevation [and] velocity” for rocket booster separation after liftoff).

74. *Decision Two, supra* note 8, at 9.

75. *Id.* at 10.

76. *Id.*

77. *Id.*

78. *Id.* at 11–12 (“Claims 8–13 restate many of the same limitations of claims 1–7, but add the steps of ‘deploying an aerodynamic control surface’ and ‘operating one or more propulsive thrusters’ to facilitate reorientation of the booster stage for a vertical, tail-first landing.”); *see* U.S. Patent No. 5,873,549 (filed Sept. 25, 1996).

79. *Id.*

‘for reorientation’ and ‘to obtain precise landing location.’”<sup>80</sup> Thus, the PTAB granted Petition Two’s *inter partes* review because SpaceX demonstrated a reasonable likelihood of prevailing on its assertions.<sup>81</sup> Most recently, while waiting for the PTAB’s final written decision on Petition Two, Blue Origin requested that Claims 1–13 be cancelled, and adverse judgment be entered.<sup>82</sup>

## V. CRITIQUE

The denial of Petition One, as well as subsequent actions taken by Blue Origin, demonstrate the precedent set by this proceeding. Had the PTAB made a final written decision invalidating the challenged claims in Petition Two, Blue Origin could have cancelled the challenged claims or made reasonable substitutions for the challenged claims to avoid enlarging their scope or introducing new matters.<sup>83</sup> Alternatively, Blue Origin could have appealed the decision.<sup>84</sup> A final consideration for Blue Origin would have been to file a continuation-in-part, which adds new matter to the claims in a separate filing.<sup>85</sup> Thus, Blue Origin’s choice to cancel Claims 1 through 13 and not Claims 14 and 15 is a possible acknowledgment of the unenforceability of Claims 14 and 15.

On the other hand, perhaps Blue Origin should have attempted to settle with SpaceX rather than waiting for a final written decision. A settlement in this situation would help guarantee there will not be an infringement claim against SpaceX after the PTAB’s decision, most likely in the form of a license. However, settlement does not guarantee the termination of the proceeding.<sup>86</sup> The actions by Blue Origin, such as the cancellation of only Claims 1 through 13 and potential litigation strategies by SpaceX, clarify the scope of precedent following the PTAB’s decision to deny Petition One.

### A. Precedent Set by This Case

The PTAB denied *inter partes* review for Petition One mainly because the claims of the ‘321 patent were indefinite, which kept the PTAB from completing its *inter partes* review petition analysis.<sup>87</sup> However, in an *inter*

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80. *Decision Two*, *supra* note 8, at 12.

81. *Id.*

82. *Space Expl. Tech. Corp. v. Blue Origin LLC*, No. IPR2014-01376, Paper No. 12, at 2 (P.T.A.B. Aug. 27, 2015); *see* 37 C.F.R. § 42.73(b)(2) (2014).

83. 35 U.S.C. § 316(d) (2012).

84. § 319 (2012); *see* §§ 141–44.

85. 37 C.F.R. § 1.53(b)(2) (2015).

86. § 317(a) (2012) (“[U]pon the joint request of the petitioner and patent owner . . . unless the Office has decided the merits of the proceeding before the request for termination is filed.”).

87. *Decision One*, *supra* note 6, at 8–9.

*partes* review, the PTAB may only undertake an obviousness or novelty analysis and the PTAB does not have the authority to determine whether a patent is indefinite.<sup>88</sup> Interestingly, even the PTAB's broader claim construction standard determined the claims to be indefinite.<sup>89</sup>

A denial creates a situation where the PTO acknowledges that it issued otherwise invalid patent claims, but the PTO does not have the authority to rule them invalid in the proceeding. SpaceX has, in a sense, eliminated Blue Origin's ability to enforce its claims. If Blue Origin attempts to enforce those claims in an infringement suit, a defendant will be able to refer to the PTAB's ruling, stating that Blue Origin's claims were previously determined to be indefinite. In this light, while the PTAB denied SpaceX's petition, SpaceX ultimately won because of the PTAB's decision.<sup>90</sup>

The PTAB's denial also calls into question whether the PTAB superseded the boundaries of its jurisdiction, and the potential implications of this denial on future litigation surrounding this patent remain to be seen. In *Petition One*, the PTAB was not prompted to analyze the definiteness of the claims,<sup>91</sup> but the petition did suggest how the PTAB should interpret the claims.<sup>92</sup> One could argue that when the PTAB used claim-indefiniteness in its reasoning, the PTAB effectively skipped a step in the *inter partes* review process and inherently ruled the patent invalid. Importantly, after an *inter partes* review proceeding, a petitioner is estopped from asserting the invalidity of claims in district court on "any ground that the petitioner raised or reasonably could have raised during that *inter partes* review."<sup>93</sup> Thus, one can speculate as to whether this reasoning has any precedential value or if district courts will merely ignore it for being outside of their jurisdiction.

## B. SpaceX's *Inter Partes* Review Strategy

In observing future *inter partes* review strategies, it is important to analyze the strategy SpaceX took in its *inter partes* review petition. SpaceX likely chose the *inter partes* review procedure, instead of filing in federal district court, for several reasons. The primary reason may be that *inter partes* review proceedings require a broader claim construction standard, and the process is typically faster and cheaper with a higher success rate than filing in federal court.<sup>94</sup> SpaceX would have been barred from arguing under

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88. § 311(b); see §§ 102–103.

89. See *Decision One*, *supra* note 6, at 6; see also 37 C.F.R. § 42.100(b).

90. See *Decision One*, *supra* note 6, at 8–9.

91. See *id.* at 6.

92. See *Petition One*, *supra* note 5, at 15–22.

93. § 315(e)(2) (2015).

94. See David Cavanaugh & Chip O'Neill, *WilmerHale Inter Partes Review (IPR) Webinar Series: IPR Strategies with Existing Litigation*, WILMERHALE 1, 11 (Sept. 10, 2013), [https://www.wilmerhale.com/uploadedFiles/WilmerHale\\_](https://www.wilmerhale.com/uploadedFiles/WilmerHale_)

a more lenient standard in *inter partes* review proceedings had it filed its petition in federal court first.<sup>95</sup> Thus, several *inter partes* review strategies can be distilled from this proceeding for future implementation.

One strategy implemented by SpaceX included using two *inter partes* review petitions over the same patent. The sixty page limit for *inter partes* review petitions reflects a simple explanation for the filing of two petitions.<sup>96</sup> Petition Two, at fifty-seven pages, neared the sixty page limit, while Petition One included only forty-three pages.<sup>97</sup> SpaceX's attorneys may have anticipated Petition Two would require a more extensive analysis in the petition and, thus, opted to use separate petitions. SpaceX's attorneys may have also filed two petitions based on the prior art used in the claims; prior art used in an *inter partes* review petition cannot later be used as evidence in district court.<sup>98</sup> Additionally, *inter partes* review limits what kinds of prior art are permissible but includes patents and printed publications.<sup>99</sup> Thus, SpaceX's use of prior art in the proceedings evidences another potential strategy.

### C. Implications on the Commercialization of Space Travel

SpaceX's *inter partes* review petitions are only the latest dispute between these major space travel companies. In 2013, SpaceX won historic launch pad 39A from NASA, "which had served as the launch site for Apollo moon missions as well as space shuttle flights."<sup>100</sup> Further, in 2014, SpaceX won a government contract over Blue Origin to transport U.S. astronauts to the ISS.<sup>101</sup>

This case may serve as a great example of law interfering with the development of commercial space travel in the United States. Commercial space flight benefits greatly when technology is in the public domain, al-

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95. § 315(a)(1).

96. 37 C.F.R. § 42.24(a)(1)(i) (2015).

97. See *Petition One*, *supra* note 5, at 43; see also *Petition Two*, *supra* note 5, at 57.

98. See 35 § 315(e)(2).

99. *Id.*; § 311(b).

100. Alan Boyle, *Bezos' Blue Origin Space Venture Loses Protest over NASA's Launch Pad*, NBC NEWS (Dec. 12, 2013, 6:43 PM), <http://www.nbcnews.com/science/space/bezos-blue-origin-space-venture-loses-protest-over-nasas-launch-f2D11736708>.

101. See Press Release, NASA, Commercial Crew Transportation (2015), [http://www.nasa.gov/sites/default/files/atoms/files/ccp\\_olia\\_fact\\_sheet\\_final\\_508.pdf](http://www.nasa.gov/sites/default/files/atoms/files/ccp_olia_fact_sheet_final_508.pdf).

lowing RLVs to be invented properly.<sup>102</sup> Currently, SpaceX is the closest to properly inventing the subjects of the '321 patent, but the technology has yet to function efficiently.<sup>103</sup> Allowing patents in the space exploration technology field will continue to inhibit space travel, all while post-grant proceedings, such as the *inter partes* review, increase litigation spending for private companies.<sup>104</sup>

The purpose of these private companies is to decrease the cost of space travel,<sup>105</sup> but it is consumers who could end up bearing the costs caused by continued litigation when the space traveling businesses begin to operate. Perhaps this is the system we need. If Blue Origin's patent is valid, it will force SpaceX to alter its invention to achieve the same purpose. Thus, an issued patent would spur the creation of differing space traveling technologies. In the end, proceedings such as this further delay the opportunity for mankind to achieve deep space travel and demonstrates the need for a better system to continue fostering growth in the industry.

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102. See Press Release, NASA, NASA Makes Dozens of Patents Available in Public Domain to Benefit U.S. Industry (May 5, 2016), <https://www.nasa.gov/press-release/nasa-makes-dozens-of-patents-available-in-public-domain-to-benefit-us-industry>.

103. See SpaceX, *CRS-6 First Stage Landing*, YOUTUBE (Apr. 15, 2015), <https://www.youtube.com/watch?v=BHMSzC1crr0>.

104. See Cavanaugh & O'Neill, *supra* note 94, at 15.

105. See SpaceX, *supra* note 2.

